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AUGUST
1946

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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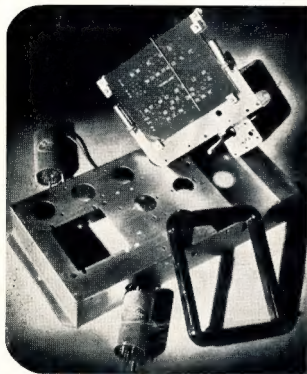
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Editorial

Well we have broken back into 40 and 20! Not far yet—not nearly far enough but it is a good start. It won't be very long before we get another slice and an even more satisfactory portion of the pre-war bands and then we will be able really to feel that Ham Radio is again in its stride.

While on this subject of frequencies it is only right that the quite unfounded criticism of the P.M.G. Department concerning the re-opening of our HF bands, should be debunked. Such questions as—why weren't they re-opened weeks ago? Why did the Hams in such and such a country receive three weeks' notice and we received none? Why did so and so get back 3.5 Mc. band and we did not? Quite naturally these have been asked but in both the Press and certain Radio Periodicals the blame has been laid at the door of the P.M.G. Department. The truth is that the Department made available the portions of the 7 and 14 Mc. bands within a matter of hours after they were released by the Services and the authority to use them was from the time your Federal President left the Chief Inspector of Wireless, not after official Ministerial announcements or after licence endorsement. Nor can blame be attachable to the Services, they are clearing appropriate portions of the spectrum as rapidly as possible, but difficulties peculiar to this area have prevented as rapid a clearance as has been possible in certain other parts of the world.

Your Federal Executive is in the closest contact with the P.M.G. Department and you can be assured of the earliest practicable release of our bands as they are made available, portion by portion. Not only that, we are now hard at work with the Department on those matters raised at the last Federal Convention and will have some announcements of considerable interest and importance to make shortly. Without attempting to make any forecasts we can say that our discussions with the P.M.G. Department have been on as friendly a plane, based upon a clear understanding and appreciation of the Amateur case, as ever existed in pre-war days.

During the period when Ham Radio is getting re-established and the P.M.G. Department administrative machinery is settling down patience and restraint are essential on all our parts. We deplore as much as the unfortunate recipients the immediate suspension of station licences for off-frequency operation without reference to the Advisory Committee, as has recently occurred

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FIG 1A
HORIZONTAL
BEAM

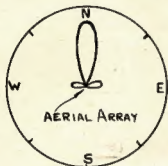


FIG 1B
DIRECTIONAL
BEAM

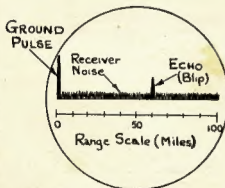


FIG 2
SCREEN OF C.R. TUBE

C.R.T. Owing to the steep-sided wave form of the received echo a very wide band width is necessary, and values in excess of plus or minus 140 Kc. are quite common.

As mentioned earlier, a Cathode Ray Tube is used as the display system and usually takes one of two forms. The first is known as a P.P.I. (Plan Position Indicator) and has a radial time-base with the commencement in the centre of the tube.

The screen is usually marked off as a map of the particular location with the transmitter located in the centre. The trace is then made to sweep round in synchronism with the aerial. A long after-glow tube is used and the echo intensity modulated so that targets are indicated by a bright spot on the screen. After one revolution, all targets within range can be seen in their actual position.

The second is the more common linear time base shown in Fig. 2. In this case, the transmitter is synchronised to pulse at the same time as the time base commences its traverse across the tube.

The L.W.-A.W. Mark IA Early Warning Set.—As its name implies, this equipment was designed to fulfil one purpose only—that of giving warning of the approach of enemy aircraft. A job it performed very ably in the S.W.P.A.

Its characteristics are:—

Peak Power, approximately 30 K.W.

Pulse length, 20 Micro Secs.

P.R.F., 50 c.p.s.

Range, calibrated to 130 miles.

Accuracy, limited.

Frequency, 200 Mcs.

Referring to the block diagram of Fig. 3, it will be seen that the heart of the circuit is the Multi-Vibrator which provides the original wave form for the transmitter and also for synchronising the time base. The Multi-Vi's are of conventional design using a pair of 6J7's which are tied to the 50 cycle mains to ensure that 50 cycle P.R.F. is maintained.

The output from the Multi-Vi. is rich in harmonics and has a more or less square wave form. To make it even more square, the output is passed through a further 6J7 which is heavily overloaded, the result of which is that on the negative peak cut-off is soon reached and no further change in output current can be possible. On the positive peak, saturation takes place so that both top and bottom of the wave are flattened. The amplification makes the sides slope more steeply. A glance at the wave forms of Fig. 4 will enable this to be seen more clearly.

The output from the squarer valve is now passed through what is known as a pipping circuit (i.e. a low time constant Resistor-Condenser combination) the action of which is as follows:—

The negative going wave form from the squarer charges up side (a) of Condenser C (Fig. 5) and holds it steady at full potential until the wave form changes. In the meantime, side (b) has been allowed to discharge through Resistor R in the familiar exponential curve. When the polarity changes, side (a) again follows and is held positive, side (b) again discharging immediately the charging voltage becomes steady. Referring back to (c) of Fig. 4 should make this clear.

The next valve, an 807, is heavily biased so that only the portion shown dotted has any effect on the grid. The output fed to the modulator is as shown (d) of Fig. 4. So much for the pulse forming circuit.

The modulator consists of an 807 acting as a phase inverter, and another as a Cathode Follower. Positive output from the C.F. is applied to the grid of an 833 valve which is in series with the oscillator valves. The 833 (and consequently the Oscillator Valves) are held highly negative so that oscillation can only take place when the relieving positive signal is applied. The set

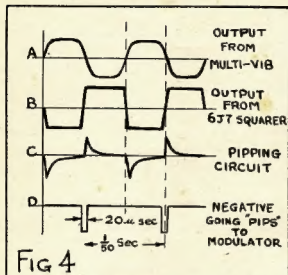
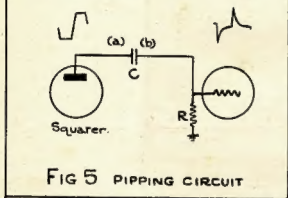


FIG 4



then transmits for 20 micro seconds at a P.R.F. of 50 c.p.s.

It should be mentioned that the Oscillator Valves—VT90's—were specially designed triodes for U.H.F. operation and work in a conventional lecher-tuned circuit.

The antenna which was designed by Mr. Worledge of the N.S.W. Railways, contains 32 half-wave dipoles arranged in four bays horizontally spaced one wave length between centre lines. A mesh type reflector screen is mounted behind the array at a distance of $1/8$ th wave length, which gives best back-to-front ratio at 330 Ohms impedance.

The lobe patterns are approximately those of Fig. 1 (a) and (b).

The antenna together with the Transmitter and Receiver cubicles is mounted on a platform and the whole is easily rotatable through 360 degrees by means of a hand wheel, thus enabling all-round cover to be maintained.

The Receiver consists of two R.F. stages using 954 scorn pentodes, followed by 955 triode mixer and os-

cillator. The triode mixer being used to keep valve noise to a minimum. The tuned circuits consist of lumped inductance resonating with its own self-capacity, and are tuned by a brass slug the movement of which varies the inductance.

The I.F. amplifier employs four stages using 1852 television pentodes. I.F. frequency is 30 Mcs.

One section of a 6H6 is used for detection, the other section acting as a limiter on the input of the video amplifier—an 807.

Receiver gain is controlled manually by a variable bias Resistor operating on the first three I.F. Valves.

The display is situated on the Indicator rack and consists (together with the Multi-Vi's and Squarer and Pulse-Gen. already described) of an 1802 C.R.T., associate time-base circuit and black-out valve.

The output from the Multi-Vi's is also used to trigger the time-base. It is passed through an 807 (Fig. 6) which is normally drawing fairly heavy current. The negative cycle from the M.V. reduces the Ia and allows Condenser C in the bridge circuit to charge producing the familiar saw-tooth wave form.

It will be seen that by varying the value of the Range Pot the balance of the following 807 time-base amplifier will be upset and the trace moved bodily across the screen. This provides an efficient method of determining

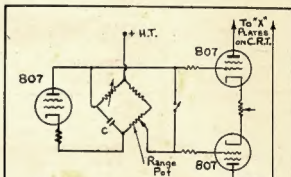
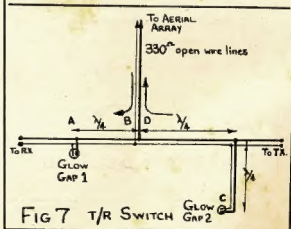


FIG 6 RANGE CONTROL



CLEARING THE ETHER, Series II, Part IV

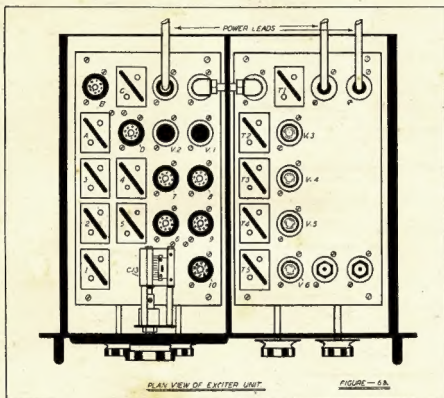
*By G. Glover, VK3AG

This part deals with the construction of Basic Frequency Generator and the theoretical requirements for Frequency Generators and Multipliers.

CONSTRUCTION AND OPERATION OF MODERN TRANSMITTER

satisfies the major requirements outlined under "economics" and "standardisation."

In order to convey picture of completed set up of exciter unit, Figure 6a shows plan view of both B.F.G. and Frequency Multiplier set up on tray. While Figure 6b depicts Front Panel lay-out. Some Coil Units have been



In preceding sub-section, writer dealt with electrical aspects of Basic Frequency Generator chosen as a basis for discussion. In this sub-section the mechanical aspects of the unit will be thoroughly covered.

There are numerous ways in which we can construct our unit to comply with the circuit requirements of figure 5; however, in planning any lay-out we must bear in mind all those points discussed in earlier sections.

The sliding valve section or coil cradle operated by rack and pinion movement, is the utopia in so far as shortness of electrical connections is concerned; but requires far too much space when a large number of tuning units are involved. The circular turret provides the next solution, but like its predecessor requires too much space. Irrespective of what lay-out we decide on we are always faced with the fact that multi-channels require space, and space means longer leads; all we can do is to strike a happy medium.

The design chosen for the purpose of this discussion

left out to show socket arrangement more clearly.

The reason for employing a flat plate, with the exception of aprons each side for the purpose of stiffening plate, is so that it is fully accessible for wiring and trouble shooting. A description of its disposition in actual use will be given later. Socket mounting holes have been arranged on the angle to allow as much space as possible between sockets, and at the same time provide for as wide a range of sockets as possible. The plate itself is constructed of 18 gauge steel, copper plated to provide conductive surface for R.F. and then cadmium plated for appearance.

It must be borne in mind, that while the completed unit is described in this sub-section, it is not necessary to complete the unit before it can be used. Setting up the components required for say, V.F.O. or one channel of Crystal Control (C.C.) will suffice. The advantage of starting off this way and working towards the final goal as finance permits, is that, the only waste incurred, if any, is the wire used to make temporary connections.

The oscillator tuning elements are concentrated around

the V.F.O. Tuning Capacitor at one end of the sub-panel as shown, sockets 1 - 10, and a three section, eleven position, single pole rotary switch used to effect selection of the units involved. The zig-zag numbering employed reduces leads to minimum length and minimises confusion of wiring.

The output units are likewise associated with a two section, five position, two pole, rotary switch. This switch is mounted in the middle of the four sockets at the rear end of sub-panel and is referred to as "Output Selector." The corresponding contacts on both sections of the switch are bridged, doubling the contact area thereby reducing contact resistance and operating faults.

The two valve sockets and power plug, together with associated components, provide a very compact "valve section." C1, C7, C8 and C12; R1, R4, R7 and R8 are mounted directly on sockets/plugs, or in wiring, to reduce the length of R.F. circuits. RFC1 has "Hot" end connected direct to socket leg for the same reason. The remaining Condensers, Resistors and RFC2 are mounted on two Ceramic strips, supported on 2-in. by 1/2-in. Bakelite pillars, directly below the valve sockets. By using insulating material for the pillars, full use can be made of all tags.

The last remaining item is the output socket associated with the links. This item is located in the right hand rear corner of the sub-panel, so placed as to be adjacent to the next unit. A short length of co-axial cable is employed to couple the socket to the output selector switch. The reason for employing standard valve hole punching and adaptor plate for socket, is to facilitate mounting different types of fittings, and at the same time retain flexibility of sub-panel. This latter angle will be better understood when we come to the Frequency Multiplier.

Mechanical Aspects of "Tuning Units"

Each set of tuning elements is mounted in a can 2-in. by 1 1/2-in. at the base and 4 1/2-in. high. The can is equipped with small handle at the top and octal plug at the base, as depicted in Figure 7, which represents a typical crystal controlled unit. "V" and "W" represent small Hammarlund type, air dielectric, Ceramic mounted, Trimmer Condensers, having screw driver adjustments accessible through convenient holes in the top of cans. "X" depicts crystal holder of either miniature or small portable service type plugged into socket. The advantages of mounting crystal in individual "Tuning Units" are two fold: (a) space economy, (b) shortness of electrical wiring.

"Y" Coil Former of Ceramic or Polystyrene, except at low frequencies where properly treated Bakelite tubing may be employed.

"Z" Zero or negative temperature co-efficient Silvered Mica Condensers or Ceramic employed as main Tank Capacitors.

Other units are arranged similarly but with obvious omissions. Units should be color coded to enable quick identification.

Actual Electrical Values of Components used by the writer in conjunction with type 6AC7/1852 valves are tabulated hereunder. The 6AC7 valves were chosen mainly because of their socket connections, general characteristics and availability. Other types of pentode are equally adaptable.

R1—0.5 Meg Ohms, 1 Watt Carbon.

R2—50 Kilo-Ohms, 1 Watt Carbon.

R3—10 Kilo-Ohms, 2 Watt Carbon.

R4—100 Kilo-Ohms, 1 Watt Carbon.

R5—160 Ohms Non-Inductive Wire Wound Bobbin.

R6—See text.

R7, R8—1,000 Ohms, 1 Watt Carbon.

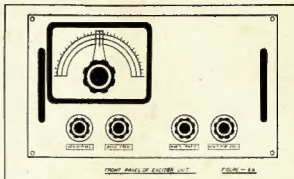
R9—See text.

C1, C8—100 Mmfd. Silvered Mica.

C2, C3, C4, C5, C6, C7, C9, C10, C11, C12—0.01 Mfd. Mica.

C13—10-250 Mmfd. Variable.

C14—250 Mmfd. Silvered Mica or Zero Co-efficient.



Suggested values of components to be used in "Tuning Units" are tabulated hereunder:—

V.F.O. and E.C.O. 1.5 Mc. to 2 Mc. Oscillator Units:— Inductance 40 turns 22 S.W.G. Enamelled Copper at 24 T.P.I., Tap at 14th turn.

Capacity (shunt) 500 Mmfd. Silvered Mica or Zero Co-efficient. Add Ceramicons and trimmer for pre-tuned units.

C.C. 3 Mc. to 4 Mc. Oscillator Units:— Inductance as for V.F.O./E.C.O. above.

Capacity (shunt) 200 Mmfd. Silvered Mica or Zero Co-efficient. Add Ceramicons and trimmer to obtain desired Frequencies.

Buffer Tuning Units:—

1.5 to 2 Mc. Inductance:—120 turns 30 S.W.G. Enamelled Copper at 70 T.P.I.

3 to 4 Mc. Inductance:—85 turns 26 S.W.G. Enamelled Copper at 48 T.P.I.

Capacity in both cases, trimmer plus Ceramicons, to reach desired Frequency.

All Inductances are wound on 1/2-in. diameter Former and expansion and compression of end turns is employed as means of adjusting Inductance to final figure. So far no mention has been made of the links. These Coils are wound at the cold end of the main Coil. The number of turns will depend upon the connecting cable used and other factors which will be covered more thoroughly under the heading of Frequency Multipliers.

Points To Watch in Wiring Unit

- Keep all leads as short and direct as possible.
- Maintain symmetry in heater wiring.
- Return circuits should go to common point. Don't run a long loop around the tuning unit sockets and couple them in like Chinese lanterns. Use 16 S.W.G. Tinned Copper Wire and join them in pairs. Sweat wires together to form a wide tape where they converge on common point.
- Earth Pin No. 1 on each tuning unit socket by short length of 20 S.W.G. Tinned Copper Wire, under locking nut on the nearest socket mounting screw. The same applies to plugs on tuning units. The idea is to ensure that the tuner shields are at the same potential as adjacent sub-panel. It is possible that spurious oscillations will occur at higher frequencies unless several fingers are employed to earth the can.
- All Sockets and Plugs should be mounted so that the locating pin faces the same way, otherwise Coil Units will not line up.
- The Variable Condenser C13 should be insulated from earth and direct connections made as shown in the circuit.

Improvements and Variations

- If any inter-action is experienced due to coupling provided by socket wiring capacity, this may be eliminated by adding shorting section to switch or

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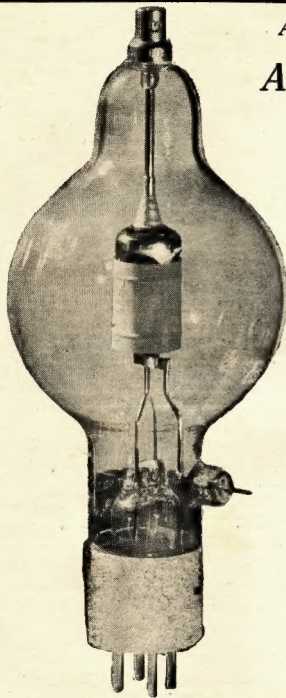
25T—25 Watt Medium Mu Triode Modulator, Oscillator and Amplifier.

RX21—Mercury Vapour Rectifier.

35T—50 Watt High Mu Triode, Modulator, Oscillator and Amplifier.

KY21—Mercury Vapour Rectifier.

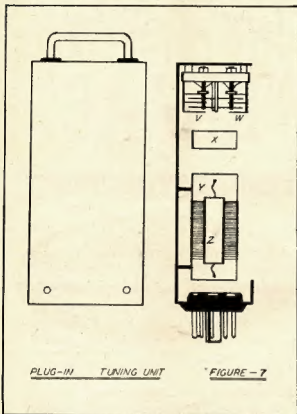
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switches. One must bear in mind of course, that the V.F.O. operates on two contacts; therefore, either one range must be sacrificed, or shorting contacts omitted from these positions.



- (ii) By referring to Figure 5, the reader will observe that the Variable Capacitor associated with the V.F.O. is connected to pin 4 of the socket. Thus, if normal pre-tuned tank unit is inserted into this socket, the Variable Capacitor will not be connected into the circuit, and this position may be used as a pre-tuned point.
- (iii) If a Variable Capacitor is available with a higher capacity than that required to traverse the required band of Frequencies, it can be employed by inserting fixed capacitor in series therewith.
- (iv) If considered desirable V.F.O. can be arranged to operate in the 2 Mc. to 4 Mc. range instead of present range, which relies on the harmonic content of the buffer amplifier output for operation in this latter range.

MOUNTING THE BASIC FREQUENCY GENERATOR

As can be seen from Figures 5a and 5b, in actual use the B.F.G. and associated Frequency Multiplier are mounted side by side on a sliding tray. Both sub-panels are mounted on 3½-in. by ½-in. Brass Pillars, four to each plate. The tray is fitted into 10½-in. assembly (6 units) and slides forward until stop pins are encountered, thereby permitting access for the purpose of changing or adjusting coil units. To facilitate this, R.F. and power leads are provided with a reasonable degree of freedom.

A shield is provided between the B.F.G. and Multiplier in the form of a metal plate. The dust cover associated with the assembly completely encloses the entire unit.

The switch shafts for both B.F.G. and Multiplier are extended through the front panel via flexible couplings and bushes in the panel. The V.F.O. Condenser is mounted on Bakelite plate and coupled to "ABAC" vernier drive equipped with perspex pointer, which operates over a set of three semi-circular scales. Graduated 0 to 100 degrees, 1.5 to 1.7 Mc., and 1.7 to 2 Mc.

FREQUENCY MULTIPLICATION

Having obtained our basic frequency we are now faced with the problem of multiplying that frequency to the ultimate operating frequency required.

For numerous reasons, particularly when crystal control is employed, it is more economical to generate basic frequencies in the lowest band to be employed, and multiply the frequency to the desired degree. Foremost of these reasons are:—

- (a) Stability requirements.
- (b) Physical limitations of crystals.
- (c) Need for lower frequencies.

The major requirements of harmonic generators are:—

- (i) Stability.
- (ii) Frequency coverage.
- (iii) Spot frequencies.
- (iv) Compactness.
- (v) Minimisation of controls.
- (vi) Definite identification of harmonic being used.

(i), (ii), (iii), (iv), and (v) have been covered under the heading of B.F.G. and the rules as applied to Harmonic Generators or Frequency Multipliers are somewhat similar.

Definite identification of harmonics being used:—

Wherever Harmonic Generators are employed we are faced with the evils of heterodyne relationships, which become more and more involved the greater the degree of multiplication involved. Sum and difference frequencies not only of the fundamental but also of the harmonics, sub-multipliers, etc., crop up. Admittedly careful guesswork of L and C values, both lumped and distributed, give some clue as to the frequency, but there is always an element of doubt, which can best be settled by using our old friend the "Absorption Wavemeter." The method of listening for even harmonics, although generally helpful, can be misleading if complex conditions exist.

The best method of generating high order harmonics appears to be the Reinartz Generator or similar regenerative circuits; but, all Harmonic Generators must be tuned to resonance. Hence, unless we are prepared to use turret structure of pre-tuned units, we are faced with two tuning controls.

As the object of the present discussion is to reduce controls to a minimum, the writer has discarded the Harmonic Generator in favour of the "Frequency Multiplier" or "Harmonic Amplifier."

The terms "Harmonic Generator" and "Frequency Multiplier" or "Harmonic Amplifier" have been chosen to differentiate between circuits employing feed-back to generate or emphasise selected harmonic, and amplifiers which are operated with very high bias to accentuate the harmonic content in the anode circuit by virtue of asymmetrical nature of power pulses applied to tank circuit, which is tuned to the desired harmonic.

The generous harmonic content of the output from tetrode or beam tube is too well known to need further amplification here.

EDITORIAL.

in one State. But such incidents will speedily be ironed out and our hands as well as the Regulations under which we operate on them will be very much more to our liking in a short space of time if we are all prepared to exercise reasonable patience in the interim.

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PROPAGATION PREDICTIONS FOR AUGUST 1946

The following information is extracted from the Radio Propagation Bulletin for August 1946 No. ARPC-A20, published by the Australian Radio Propagation Committee.

With the release of portions of the 20 and 40 meter bands, more use can be made by amateurs of the information contained in these monthly bulletins. Although day to day variations in conditions are bound to occur the charts contained in the bulletins can be taken as indicative of the general trend of ionospheric conditions.

As has been previously explained, the Charts are calculated for single hop working only.

For multiple hop paths it is necessary to use the working sheet provided with the Bulletin.

Zone E.—Latitude 10 degrees South—(North Queensland, Northern Territory, North Western Australia):—

28 Mc.—In this Zone 28 Mc. seems to be holding up quite well and should be useful for 1500-2500 miles' skip from 0800 hours to 1700 hours.

14 Mc.—This frequency becomes effective at 0700 hours when the skip distance is in the vicinity of 1000 miles. From 0700 till 0900 skip is reduced to approximately 400 miles, which condition holds until around about 1400 hours. After this time skip distance steadily increases until it is at a maximum of 2500 miles at 2200 hours. Best DX time on 14 Mc. in this area should be from 10 p.m. till midnight.

7 Mc.—Doesn't seem to be in the race for DX with

possible exception of a short period of 2000-2500 miles' skip which may occur at 0400 hours but will probably not last for more than a few minutes and another period commencing at 2000 hours and lasting for possibly an hour, when skip will be around 500 miles.

Zone E.—Latitude 20 degrees South—(Southern Queensland, New South Wales, South Australia, Western Australia):—

28 Mc.—This band seems to be a wipe off for DX in this Zone with the possible exception of a short period of 2500 miles' skip which may last from 1100 hours to 1500 hours.

14 Mc.—Shows distinct possibilities. From 0001 hours till 0300 hours, skip is 2500 miles, after which time there is a complete fade out until 0600 when skip is approximately 2000 miles. From 0600 onwards this distance will gradually decrease until it reaches a minimum of about 700 miles at noon and will then increase to a maximum of 2500 miles at 2000 hours. This condition will probably hold good until midnight. Best 14 Mc. DX time in this Zone is from 9 p.m. till 3 a.m.

7 Mc.—May show a peak from 0400 hours till 0430 hours when skip will be about 1000 miles, and will gradually decrease until a complete fade out occurs at 0900 hours. However from 1600 hours onwards the band should open up again and reach a peak of around 700 miles at 2200 hours.

(Continued on page 10)

KINKS FOR 807 USERS

By J. Brown (VK7BJ)

Here are a few kinks that may be of use to the large number of Hams who use 807s for their output valve. The basic circuit used is shown in Fig. 1. Owing to compactness being desired, blocked grid keying was ruled out, as opening the grid return is not sufficient to cut off an 807. Cathode keying was not desirable, as the heater supply of the 807 had to be earthed. After trying to suppress clicks when the key was placed in the H.T. lead, the key was tried in the screen. Opening the screen was found to completely cut off the plate current, a negative voltage building up on the screen. The addition of a 0.1 mfd. Condenser from screen to earth, in conjunction with the 16,000 Ohm dropping Resistor, makes a time delay filter which works on both make and break. This eliminates the clicks very effectively. The 0.1 mfd. Condenser, together with the R.F. Chokes and by-pass Condensers (which prevent interference due to sparking at the key contacts from being radiated), is mounted

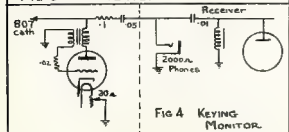
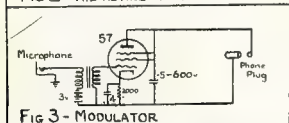
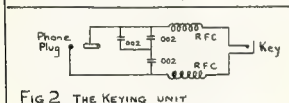
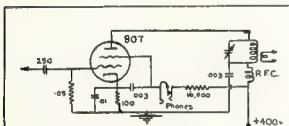
right at the key. See Fig. 2. As the key is alive insulated protection should be provided, or a relay could be used.

It was desired to use phone for local work with the minimum of extra parts and trouble, and the modulator of Fig. 3 proved to fill the bill nicely. The 807 is adjusted for CW conditions and the modulator plugged in place of the keying unit. The 57 (other electron types may be used), being in series with the 807 heater supply, drops it to about 125 volts, causing the plate current to drop to about half normal. Speech input to the 57 grid causes its plate resistance and, consequently, the screen voltage of the 807, to vary accordingly and so modulates the output. With a good single button Microphone of the modern inset type, about 80% of good voice quality modulation can be obtained, the plate current kicking upwards slightly at full modulation. It is preferable not to earth the 57 heater directly, but through a large Condenser.

NOTE.—These circuits are only recommended for beam tetrodes, the screen characteristics of pentodes such as 802s being unsuitable.

The third kink, a side-tone note for monitoring keying, is fairly well known now, but the arrangement shown in Fig. 4 is very convenient, as it is entirely automatic in operation. The 807 is keyed the usual double-biased in accordance with the keying, and is used as the plate supply for an audio oscillator, which is connected, via an isolating Condenser and Resistance to the normal Headphones. The Rheostat in the heater is used to adjust the note (as a heater type valve is used, the adjustment is sluggish). Any old transformer and valve are suitable, in fact, within limits, the older the better. The 0.01 mfd. Condenser used between the Phones and the Receiver was chosen to resonate, with the Phones used here, at about 1,900 C/s. for CW work.

To finish on a somewhat gloomy note, a lot of 807s seem to be subject to a somewhat mysterious complaint, less so on output whilst still drawing normal current. This is usually due to the heater voltage being below normal, due to line voltage variations. The symptoms are normal output when the key is first pressed, but it then falls off. The best remedy is to see that the heater voltage is correct. If this cannot be managed, I believe that special 807s, tested for operation on 5.5 volts, can be obtained.



PROPAGATION PREDICTIONS FOR AUGUST

Zone E.—Latitude 30 degrees South—(Victoria, Southern New South Wales, Southern South Australia, and Southern West Australia):—

28 Mc.—May, under favourable conditions, have a skip of 2000 miles or so from 1100 hours till 1600 hours, but generally may be considered as unreliable for DX.

14 Mc.—20 meters doesn't really come to life until 0700 hours when skip is 2500 miles. This steadily decreases to a minimum of 800 miles at 1000 hours which condition holds good until 1600 hours when skip steadily increases until at 1900 hours it is once more 2500 miles.

7 Mc.—Shows promise. From midnight till 0600 hours skip is around 1000 miles, after which there is a sharp

fade out which reduces skip to 0 miles at 0800 hours. However at 1600 hours the band opens up once more and may reach a possible peak at 1000 miles at 2200 hours.

Zone E.—Latitude 40 degrees South—(Tasmania):—

28 Mc.—VK7's can forget all about 10 meters for all but ground wave work, although there may be a possible peak of short duration, 2500 miles' skip at 1400 hours. But don't hope for too much.

14 Mc.—Does not seem to be of much use until 0700 hours when skip is 2500 miles. From 0700 hours skip is gradually reduced until at 1400 it reaches its minimum of 1000 miles. After this time it gradually increases to the maximum of 2500 miles at 2000 hours. This condition may last until 2200 hours after which the band will probably fade out. In general, 14 Mc. seems fairly reliable for DX work for VK7's.

7 Mc.—From midnight till 0400 hours, skip is 1000 miles, after which it rises to a peak of 1500 miles at 0530 hours, then gradually fades until at 1100 hours skip is 0 miles. At 1800 hours the band opens up once more and at midnight reaches its peak of 1000 miles.

To interpret all the foregoing in terms of DX working, a few facts must be borne in mind. In the first place, the predictions hold good only when the point of reflection falls in E Zone and within a range of plus latitude 5 degrees to minus latitude 5 degrees from the latitude of the transmitting station. Secondly, the predictions do not take into account the possibility of freakish conditions such as sudden magnetic disturbances, etc. (These statements have been included for the sole purpose of providing me with an alibi should some irate VK7 write in and proclaim that he couldn't work VK4 when the chart says he should, or some equally irate VK4 say that he

worked VK7 when the chart said he couldn't—Tech. Ed.)

It is hoped that the publication of these predictions is of interest and use to the reader. Comments upon them would be appreciated. Our copy of the Radio Propagation Bulletin for August 1946, ARPC-A20 by courtesy of The Australian Propagation Committee.

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RADAR

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Referring to Fig. 7.—When the transmitter pulses, both gaps light, and since A is now a very low impedance, B (looking towards Rx) shows a high impedance to the transmitter pulse and energy is fed to the aerial with very little loss.

The transmitter becomes quiescent, and the gaps go out. In this case, A is now an open circuit with high impedance, whilst B now presents a low impedance to signals going to Rx. C is also a high impedance, so that D (half-wave length away) is also a high impedance and signals are prevented from going to Tx.

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FEDERAL HEADQUARTERS

New Frequencies.—We wish you to know that the frequencies released on 1st July (viz. 7.15 to 7.2 Mc. and 14.1 to 14.3 Mc.) are an interim release and we expect shortly the release of the remainder of these bands in addition to the 3.5 Mc. band, as well as some new high frequency bands. We should also like you to know that the present release has been due to the efforts of Federal Executive to have at least part of the bands restored instead of waiting until the whole of the bands were available. We desire to record our appreciation of the P.M.G. Department and its officers in their splendid co-operation in bringing about the opening of the bands in a matter of hours after their release by the Services Frequency Control Committee.

P.M.G. Department.—You will be pleased to know that the Federal Executive will shortly have a conference with the Chief Inspector (Wireless) concerning many matters of importance to amateurs. We trust the outcome of this conference will be of mutual benefit to amateurs and the P.M.G. Department.

DX Contest.—The VK International DX Contest will be held in November this year. The rules of operation are similar to prewar DX Contests and will be published in "Amateur Radio" shortly. We are receiving much support for this Contest by way of donations from various manufacturers. We should mention also that this VK DX Contest will be held in future years in October.

Log Books and Members' Stationery.—We mentioned last month that we hope to produce Station Log Books and Members' Stationery and we requested letters from

members expressing their ideas on the form these should take. To date we have not received one letter. If you are writing, address your letter to Federal Executive W.I.A., Box 2611-W, Melbourne.

Draft Constitution.—The Federal Executive is preparing a Constitution for the Institute and it is thought that members who are interested should forward to us their ideas on this subject. If you have any notions about what the aims, functions or operations of the Wireless Institute of Australia should be, do not hesitate to send them to us.

Traffic Managers.—Traffic Managers have been appointed in N.S.W. (VK2WI), Victoria (J. Tutton), South Australia (J. Kilgariff).

Do you know that attempts were made to use radio signals as navigational aids, some time before they were used for purposes of communication?

Did you know that it is frequently possible to repair tubes which show an open circuit in element connections? It is done by making a saw cut in the leg or legs, close to the base and then filling the cut with solder.

Did you know that in a commercial U.H.F. transmitter, now on the market, the grid leads, Oscillator to P.A., consist of a piece of resistance wire? It is naturally very short and provides connection between stages and at the same time is effective as a parasitic suppressor.

Having trouble with "C" "L" and "I" combinations? See page 57 QST for July, 1936.

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DX FOR THE MONTH

28-29 MEGACYCLES

Although the ten metre band is suffering from the usual winter decline, conditions have been better than anticipated and WAC has been possible most week-ends.

European contacts around 8 a.m. EST have been made on several occasions with gratifying signal reports.

The exodus to 14 Mc. has quietened the band considerably and brings up the old argument whether the band is dead when no signals are heard. Those of us with rotary beams and a working knowledge of how the band behaves can make a surprising number of contacts out of an apparently "dead" band.

It is felt that, as the weeks go by, more and more stations will return to "ten" from "twenty," where conditions are reasonably good but QRM is the biggest drawback.

With the coming of spring "ten" will rapidly recover and by October and November should provide good daytime and up to midnight DX.

Australia.—VK5NR (ex-VK3NR) up in the N.T. is one of the most consistent VK's and enjoys considerably better DX conditions than most VK's. Europeans are workable most evenings and practically everywhere except

South America during the daylight hours. He uses 25 watts on 28000 and 28150, a 3 element rotary and Vee beams. West Australia is well represented by numerous VK6's on both CW and Fone who are often heard working Asian and African stations which are not audible in VK3.

Several VK7's have been contacted and also heard working DX, they are in great demand by the W's.

VK4JP is using a copy of a Police transmitter, 6C5 7 Mc. Xtal, 6A6 doubler, 6A6 doubler, 6A6 as PP final, with 6J7, 6N7 class B modulator, a 3 element beam on 400 foot hills near Brisbane and puts out R8 Fone with only 4 watts input.

North America.—XE1JD, XE1AC are consistent and VE's and W's have been too numerous to warrant any special mention.

Central America.—HH2BL CW 28120, KP4AJ 28100, W4BZA/KP4, W8VRD/KP4, KP4AJ have all been good fone contacts in Puerto Rico.

KZ5AA has now gone home to the States from the Canal Zone and his fine signal and good operating will be missed by all VK's.

VP5RS 28180 Fone, VP5EM 28060 Fone have been fairly regular from Jamaica. TG9PB has a double bi-square beam (if anyone wants to know what that is etc. ask VK3BQ—Ed.) on Australia and puts in an amazingly good signal, S9 plus with 100 watts to PP 807's. W3IKV

mobile marine in the Caribbean Sea worked four VK3's in a row one Sunday morning.

VP9F has been contacted on several occasions. VP6YB in Barbados has been heard a few times but not up to his June strength. YN1ZK Managua, Nicaragua, was heard at fair strength but could not be contacted.

T12RC 28200 Fone has been very constant and is the loudest signal on the band outside Australia and New Zealand.

South America—VP4TR 28050 CW and Fone, VP3LF 28300, PY6AG 28040, YV5ABX 28120 Fone, and PJ3X 28000 CW are the only South Americans who appeared in VK3 during July.

Africa—VQ2FL, ZS6IJ, ZS5BZ, ZE1JU, ZE1JX, VQ3TOM, VQ4ERR were among those from the "Dark" Continent.

Europe—W8QEN/CT2, G6WY, PA0UN have been contacted around 8 a.m. and G2FZ, SV1KE, VS6DY Red Sea, OZ6WH, G5BJ, G5VE, G6TD, D2DI, SM5LF have appeared between 5 and 7 p.m.

Asia—VS1BA, VS1BJ, VS4JH, VS9MP Aden, Y12XG, Y12CA, VU2LR, VU2WP, PK6TC, C1SU China have been heard and worked by many VK3's.

The foregoing notes have been compiled by **VK1YF** and **VK3CP** and is a very fair indication of the conditions in the Metropolitan Area. It is regretted that more news from country districts and particularly Interstate does not come to hand.—Editor

Roy Jonasson VK3ND (ex-7NG, ex-4NG) now located in Castlemaine, Victoria, writes that he has been having quite a lot of fun getting and staying on 28 Mc. The rig is at present located in a 68KV sub-station where QRM is very persistent, nevertheless he has managed to tot up a very nice score of DX. Frequencies used are 28528, 28080, and 28020. He suggests that if anyone wants to know how to make a TRF perk on "Ten" they should

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14 MEGACYCLES

The 14 Mc. band opened with a bang and the QRM is now terrific. However there is plenty of choice DX coming through and is being worked by VK's.

From observations in Melbourne, the band fades out from about 10 p.m. until the early morning when the Europeans come through, but again fades out during the mid morning. In the afternoon the W's and VE's are just like locals and are easily worked.

Calls heard, worked and noted down were CSYW, SUIUS, PA0NG, F8PQ, G5BJ, G8IP, ON4PZ, EA1D in Madrid, PY6AO, C9BV, VE8AO, VE8AW, XE1AX, HC1FG, VS3JH, PA0FV, VE6CI, XU1RI, XU1MB, and CR9AN.

"FIFTY" AND UP

In the last few issues these notes were included under another heading. Now that other bands have been opened up it has been decided to separate the very high frequency notes from the others. It is hoped that those interested in these bands in the other States will endeavour to forward some details of their doings so as to keep all interested in touch with what is going on.

The main part of these notes come from Ken McTaggart (VK3NW) and goes to some length to outline just what is going on on the 50-54 Mc. band in VK3.

Unfortunately a number of stations that made an appearance on the band have dropped out, the biggest loss being Jack Davies 3JD, who, however is planning to return within a few weeks. We hope it will not be long as Jack runs 50 watts to a pair of 807's, modulated by a pair of 809's class B, and a 3 element rotary beam,

Others who have not been heard for a long time are 3LS, 3NB, 3FT, 3BW (who was only on for two days!) but will soon be going permanently), 3DA, 3TQ, and 3CO. Most active on the band are 3QO, using 2.5 watts to a single tube in a linear oscillator and a stacked array; 3MJ with 50 watts to an Eimac 100TH, a 4 element rotary beam and a super-duper receiver using ECH35's, EF50's, etc.; 3APQ, 3GG, 3HK, 3YI, and self, 3NW. The rig at 3NW consists of 807 Xtal Osc. 6314 Kc., 807 doubler, 807 doubler, 800 PA with 50 watts input, modulated by PP 807's, and a single section W8JK rotary beam. Rx here is 10 tube super with 1852 RF and 1852 mixer—not all that could be desired but it pulls them in on 6 mx quite well.

In order to stimulate interest in the band, especially for some of the chaps outside the City area who may think 6 mx is only good for "line of sight," VK3MJ and myself are initiating some portable tests with a view to determining just how far we can work. The portable equipment which I have built up consists of a MOPA transmitter using a DET3 (6J5 with plate and grid brought out the top), TPTG oscillator and 807 PA, modulated by a 6J5 into a 6V6. Choke modulation is used and a dynamic mike. The input to the 807 is 3.0 watts. The antenna a half wave doublet with co-axial feed and the receiver is a 955 super regen. into the 6J5 and 6V6 that serve as modulator or amplifier for the Rx. The results from the home QTH in Kew were excellent and the first excursion took place on Sunday, 14th July. We loaded up the "Hornet" and went to Belgrave, 22 miles air line from 3MJ at a height of several hundred feet but not "line of sight" because of intervening ridges. The power for the outfit was 180 volts of H.T. B batteries. Contact was made without any trouble. Signals from 3MJ were Q5 R9—just as loud as when only four miles from him! My signals were Q5 R5 on his Rx in Carlton. I then contacted 3QO whose signals were Q5

R5 at Belgrave. My signals at 3QO (Ivanhoe) were Q5 R4/5 on his super regen.

While the distance was not very great we were quite pleased with results especially at the strength of 3MJ's signal on 10 super regen. It was just pounding in—and also at the strength he got my 3.0 watts. The results with 3QO were also very interesting as in this case the powers were 2.5 watts and 3.0 watts and the receivers were both super regens.

It is now intended to take the portable gear to different locations round Melbourne, gradually extending the distances to see how far we can go and what the influence of intervening hills, etc., are. We plan to go to Woodend and Macedon next trip, then to Ballarat, and then Leongatha. We hope that country hams in some of these places will get interested and come on the air. Incidentally the stability of the little MOPA outfit is quite excellent and no trouble is experienced in copying it on a super using 465 Kc. intermediates and a regenerative I.F. stage.

We hear now that quite a number of W6's are running regular transmissions beamed on VK and we hope that the band will open up shortly for DX. Our tests for the ZL's and VK6's have not been successful as yet, but we anticipate results in the not far distant future. I will try and get some definite information concerning the Americans shortly. Another interesting piece of news is that VK5NR (Noel, ex-3NR) is all ready to do 6 Mx tests from Katherine.

In South Australia there is considerable activity. VK's 5GB, 5QR, 5BQ, 5JU, 5CR, 5GM and 5GF can be heard most times working among themselves and as they all somewhat live in the same area they would welcome more Hams on this band to enable contacts over greater distances, possibly with the I.R.E. Trophy in view.

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view point of the contest, so far is Prospect to Port Adelaide, and Prospect to Colonel Light Gardens. These were made before the boys were trying so it may be expected that these contacts will be knocked over any time now.

The pre-war record for the 5 Mx. band still stands at 70 odd miles. Mt. Lofty to the Hummocks with 5HD at the Hummocks and 5GB-5KL at Mt. Lofty. This will take some beating on 6 Mx., but if enthusiasm counts it is as good as beaten.

5CR worked Mt. Lofty to Outer Harbour on 6 Mx., just prior to the opening of the present contest.

Mr. R. Waters, 8 Rourke St., Woollongong, N.S.W. (telephone 1299) wishes to contact any amateurs in his district. He is willing to listen for, and report on, any 6 Mx. transmissions.

VK5GB and VK5KC have been heard testing on the 166-170 Mc. band. The obvious technical and practical efficiency required has probably deterred many from attempting to break in on this band. The same thing was said when we were given our present high frequency bands many years ago, but this did not deter the pre-war Ham and certainly will not stop the post-war Ham.

CORRESPONDENCE

Correspondents are requested to keep their letters short and to the point. The Editor reserves the right to delete anything he may think fit. The views expressed by correspondents are not necessarily those of the proprietors.

The Editor, "Amateur Radio,"

I have just received a QSL card from W9JYF who was operating portable J and he asked me to notify you that he will QSL all VK QSO's. His QTH is Ken W. Young, Woodstock, Illinois, U.S.A.

H. G. WOHLERS, VK3YV.

49 Farnham Rd., Ashford, S.A.

Editor, "A.R."

Having read a current weekly, with its design of a 50 watt Xmitter, I feel something like the enclosed should be published without delay. On top of that, I was able to listen to the plans of four prospective hams—men with commercial tickets and between them and the article referred to, I felt really sick. (You may have noted the article—I have said nothing of the modulator but if it does not provide for modulation of all three stages, I'll give the game away.)

In addition to my little effort, I would like to see some "old reliable rig" described in "A.R." Even if it means going over old ground. We have tons of new readers, new hams and etc. It would be better if we heard over the breeze that "my new rig was taken from 'A.R.'" Don't you agree?

My copy of "A.R." did the rounds at the office yesterday and the boys were most favorably impressed. There are three oldtimers there, 5GA, 5FB/5FBX and myself (now 5JD) and four or five commercials who are taking out Ham tickets. There are three new members at least for W.I.A.

SSP has erected his 60 feet steel tower. If you are interested in a description and fotos . . . in various stages of erection, let me know and will forward.

Yours etc., JACK COULTER,

VK5JD ex-VK3MV.

Why do the manufacturers of coils, I.F.s, etc., spoil the product for a h'peth of tar? Why not supply nuts with the mounting screws?

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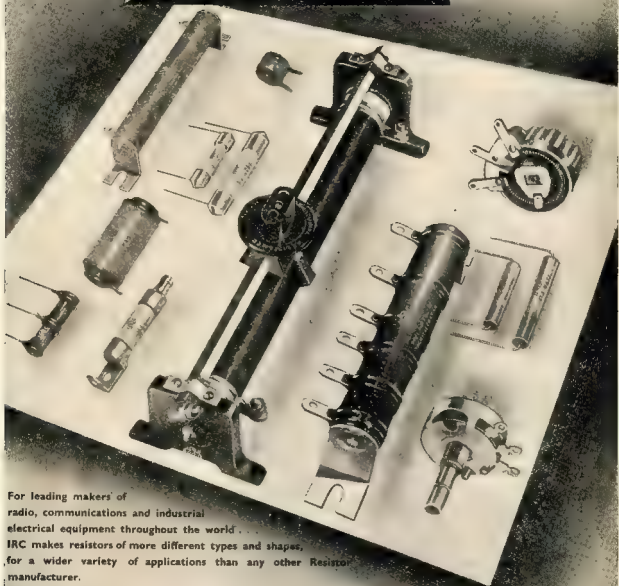
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QSL BUREAU

The following addresses of Overseas Bureaux have come to hand:—

Argentina—Radio Club Argentino, Av. Alvear 2750 7 Piso, Buenos Aires.

Holland.—VER.O.N. (replacing N.V.I.R.), Postbox 400, Rotterdam.

Great Britain:—The R.S.G.B. has appointed G2MI as QSL Manager and desires that all cards for the British Isles be forwarded to his address in lieu of that of the R.S.G.B. The QRA of G2MI is:—G2MI, Mr. A. O. Milne, 29 Kechill Gardens, Hayes, Bromley, Kent.

Cards for the following VK3 stations will be distributed at the August meeting of the Victorian Division. Those not collected may be obtained by the usual stamped addressed envelope:—

VK3's AC, AH, ABA, ADR, AFO, AFQ, AHB, ABW, ADX, AGS, AJE, AMP, ARH, ADR, BC, BR, CO, CP, CX, DA, DI, DM, EG, EN, EO, EQ, EZ, GB, GD, GX, HK, HT, IF, IG, IK, IP, IU, IW, JD, JK, JR, JE, JT, JZ, KC, KG, KI, KR, KU, MB, MJ, MR, MW, NW, OP, PG, QK, QP, QQ, QV, QW, RW, RZ, SB, TM, UC, UJ, UQ, VD, VM, VV, VU, WX, XC, XK, YH, YP, YR, ZD, and Woolliard.

Pete Mapleston (VK3QN) has moved his QTH to the Parafield Aerodrome for six months at least and has hopes of starting up as a VK5 if it's OK with his hotel manager!!

WIDCE/6 C. H. Jackson, Route 1, Box 27D, Palm City, Calif., U.S.A., is an ardent philatelist and desires to contact VK's who pursue that hobby.

Cards are commencing to dribble in from all corners of the globe, and the postwar postman on the Bureau round can't quite make out what's going on!

DIVISIONAL NOTES

NEW SOUTH WALES

Secretary: Peter H. Adams, VK2JX, Box 1734 G.P.O. Sydney.

Meeting Place: Science House, Gloucester and Essex Streets.

Meeting Night: Fourth Friday of each month.

The June General Meeting was held on Tuesday the 25th and, although the attendance did not equal the record set at the previous meeting, the Lecture Hall at Science House was just comfortably filled, with about 80 members and visitors present. No doubt there would have been a better roll-up if the meeting had been held on the fourth Friday, which is the usual date, but unfortunately the hall had been booked well ahead by the I.R.E. for this night.

No figures are available on the number of hams who turned up at the I.R.E. meeting by mistake but, if there were any, they heard the same lecture that had been given at the W.I.A. meeting three days earlier.

The lecture was titled "Modern Alchemy" and was delivered by John Briton, B.Sc., B.E., A.M.I.E. (Aust.), F.I.R.E. (Aust.). During the war Mr. Briton was in charge of Engineering Development of Radar in the Radiophysics Division of C.S.I.R. and in 1945 was appointed Chief of the Division. He has made a special study of nuclear physics and recently published a booklet on the subject, with special reference to the atomic bomb.

The lecturer traced the history and development of nuclear physics from the beginning of the century, starting with Rutherford's first experiments and Einstein's mass-energy equivalence equation and, continuing through the development of the giant cyclotrons, to the climax of the first man-made atomic explosion in the New Mexico desert.

In lucid style, Mr. Briton succeeded in giving his listeners a clear concept of the structure of the atom in the light of modern theories and went on to describe the enormous task of producing sufficient U235 and plutonium to make the manufacture of atomic bombs practicable. Some idea of the magnitude of the project can be gained by the fact that the Hanford Engineering Works, to produce about a gram of plutonium per day, requires a plant covering sixteen square miles and needs all the water of a large river, continuously flowing through the uranium piles, for cooling.

As evidence of the interest that this lecture created, there were surprisingly few matters of general business brought up by members afterwards. Presumably everyone was still stunned though being bombarded with too many neutrons!

We regret to report the death recently of Bob Fussell, VK2SS, a keen Ham and a highly-regarded member of the Institute. A wreath was sent on behalf of the Council and members of the Division and at the July General Meeting it is intended to hold an auction sale of his gear in order to raise money to assist his widow and young family.

Best news of the month was the re-opening of the 7 and 14 Mc. bands for amateur use. FHQ are to be congratulated on an excellent job well done. Less than a month ago there did not seem to be the remotest chance of these bands being made available until much later in the year. In fact enquiries through the local R.I. seemed to indicate that 3.5 Mc. was the only band likely to be released soon and that 14 Mc. was right out of the question. If there are any amateurs who still feel that the W.I.A. does nothing for them, the good work done by FHQ should convince them of the error of their thinking.

(Continued on page 20)

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IN REVIEW

We are pleased to announce publication of the 1946 edition of **THE RADIO AMATEUR'S HANDBOOK**, the Twenty-Third Edition of the standard manual of amateur radio communication.

Previous editions having fulfilled well its "duration" job as a training text in many military schools and as source data for service-written special courses, the 1946 edition of the **HANDBOOK** marks a return to peacetime conditions with a special revision to meet postwar activity requirements of amateur radio operators, many of whom themselves are returning from service.

Although work on the present edition, which began in 1945, was along previous wartime lines, the coming of V-J Day and the imminent prospect of resumption of amateur operation pointed to the necessity of a complete revamping or redesigning of prewar equipment. As the foreword states, "although it meant re-doing much of the work and delaying the appearance of the Handbook beyond the anticipated publication date, this revision has been completed."

Designed and written as an amateur communications manual, the 1946 **HANDBOOK** still retains the unique and original flavor of the previous editions that have been so widely accepted by the civilian and military radio world.

The 1946 edition is divided into three main parts. In addition, there is an Introduction containing an outline of the history of amateur radio, its present status, and prospects for the future.

The nine chapters of the "Principles and Design" section constitute a thoroughgoing textbook of radio prin-

ciples, fundamentals, theory and design, written in non-mathematical style for busy practical people of average education. From Ohm's Law to magnetrons and pulse technique, the material is arranged in topical sections to make readily possible the selection of information desired, presented concisely with ample cross-references permitting the background always to accompany the subject under consideration, and adequately supplied with diagrams, charts and graphs to illustrate each point.

Also of nine chapters, the section on "Equipment Construction" has undergone complete revision, particularly in the V.H.F. (very-high-frequency) chapters, to become a modern, up-to-the-minute practical manual on construction of all types of amateur receivers, transmitters, antennas and associated equipment. Each design—and there is one for nearly every practical communication problem—includes optional use of alternative components depending upon what might be available, a particularly important feature in these days of shortages.

Perennial features of the **HANDBOOK** are the comprehensive compilations of data on vacuum tubes, a general information section with its collection of formulas and miscellaneous data tables, and the topical index as a means of readily locating every subject discussed in the text material.

The **Radio Amateur's Handbook** (Twenty-Third Edition 1946), by the Headquarters Staff of the American Radio Relay League. The standard manual of amateur radio communication, revised and re-styled in the light of postwar needs as a radio construction manual and training text for class or home study. 688 pages, 6½ x 9½, including catalogue section and 11-page topical index. 1249 illustrations, including 114 charts and tables, 185 basic formulas.

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The W.I.A. got the bands back for the benefit of every amateur in Australia and for this reason every amateur should be a member.

Morris Meyers, VK2VN, was recently awarded the O.B.E. One of the many Hams who were in the R.A.A.F. W.R. at the start of the war, he rose to the rank of Wing Commander and was responsible for the organisation of advance R.A.A.F. communications in the Pacific theatre. Since his return to civil life he has been elected to the Council of the Division and now holds down the job of Communications Supervisor with Quantas Airways.

The response to our request for lists of countries worked was very poor—in fact the only one received so far is from Ray Priddle, VK2RA. Evidently all the other DX men thought the going was too tough and were frightened off by Ray's formidable total last month. No doubt with the choice DX now appearing on the 14 Mc. band everyone's total will go up by leaps and bounds and there will be a keener interest displayed.

What about making this a nationwide feature, Mr. Editor? An Australian DX Century Club (unofficial) should meet with general approval and would promote healthy rivalry between Divisions for the honour of topping the list each month.

VK2RA's list contained such juicy ones as VQ3TOM, YR5C, Y12XG, CR9AG, VQ2GW, OA4AS, ZACR Greece and XACP Sardinia, all worked on "Ten," and amounted in all to 49 countries, all except the last six being 28 Mc. contacts—not bad at all!

There is not much to report in the way of individual activities of members this month. Everyone (and this includes the Secretary) has been too busy either looking for the old 14 Mc. coils or winding new ones, and frantically digging out any old crystals in the hope that their harmonics would fall somewhere between 14100 and 14200 Kc. Incidentally, those crystals out of "handie-

talkies" work quite well and give good harmonic output in a triet circuit. In our case, it was necessary to increase the cathode capacity from 100 to 200 mmfd. for best results. The two pins of the holder are the same diameter and spacing as the alternate pins in an octal valve base and so two crystals can be plugged into an octal socket.

Whilst modulating our own carrier, it can be reported that at VK2JX's new location two beautiful 40-foot sticks now reach skywards and on the week-end before "20-Day" a start was made at erecting an eight-element 28 Mc. rotary. Needless to say, plans were changed before the next week-end and a 14 Mc. W8JK beam went up instead!

Jack Scott, VK2AJX, reports that, waking up at 2.30 one morning recently, he went on 14 Mc. and worked Europeans continuously for about an hour and a half. The band is only open at this time on comparatively rare occasions, but the signals arrive at the other end when there is not much QRM. Jack was in England before the war and says that at 2100 GMT the QRM from W stations is terrific and that is why you find it so hard to raise those Europeans that you hear so well just around sunrise!

We are beginning to realise that "Ten" was not such a bad band after all. There is no doubt that the band will have to be cleaned up in a big way. Whether anything can be done in the way of segregating CW and Fone stations is something that will have to be thoroughly thrashed out but, in the meantime, some control must be exercised to prevent overmodulated phones spluttering over 50 Kc. of the band. There is no excuse for overmodulation and a simple overmodulation indicator, in the shape of a milliammeter and associated diode rectifier, should be an essential part of every plate-modulated phone transmitter. Several phone stations have been heard lately working across town and overmodulating

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badly. This is a form of extreme selfishness and one wonders what has become of the amateur spirit that always characterised the game in the past.

Jim Corbin, VK2YC, has been appointed Federal Councillor for 1946. Jim represented the Division at the last two Federal Conventions.

"Ignorance Is Bliss" Department (CW Section)

Doesn't it make you feel good when, after listening to a string of perhaps eight "CQs" followed by "DX," the procedure starts all over again and you have to wait for two or three minutes before this bird finally signs. How is anyone to know whether he is DX or not, until he gives his call? Of course, only VK's seem stupid enough to adopt this practice and so you can bet that he is not DX to you.

VICTORIA

Secretary: R. A. C. Anderson, VK3WY,
 Box 2611 W. G.P.O., Melbourne. WM 1579.
 Meeting Place: Lecture Hall, Chamber of Manufacturers'
 Building, 312 Flinders Street, City.
 Meeting Night: First Tuesday of each month.

With 3KN "Disposals" Kinnear in the chair the July meeting was devoted to "wax-boring" on matters of great importance, mainly due to the untiring efforts of the Chairman and Secretary, to obtain materials from the Disposals Commission at the best possible advantage. Amongst the items purchased was a small quantity of Class "C" Wavemeters and judging by the numerous disappointed applicants it clearly indicated the value of such an instrument and also the sound judgment of the Institute representatives.

Ere this appears in print many members will have collected meters and other equipment for which they were successful in tendering and eagerly await the arrival of other items from Interstate.

The meeting was again one which displayed the increasing interest and membership in that 160 odd were present of which P. Monfries (VK9RN) and G. Waller were visitors, the remainder being VK3's: OF, OT, AJH, TU, IU, QZ, ST, AJA, IO, OV, IW, TE, UH, ALW, AHO, RX, OK, AKL, KC, QC, CT, JO, RN, XJ, IK, FR, BD, AP, FS, CZ, CP, DM, JI, PU, AGS, RI, LA, TF, VZ, DF, AT, LI, QP, LN, LF, LL, VX, QE, AHM, UJ, AG, AI, AJK, EK, PW, RT, BJ, LS, GU, OP, HB, OZ, ARN, YK, YJ, ABA, PG, RJ, UM, XR, ZC, ADS, SK, LX, EA, ZB, ML, GG, UK, BQ, ZV, VQ, KV, IC, OJ, DN, JA, XK, KM, WY, WQ, CF, KN, NU, and Messrs. Cairns, Sloane, Belcher, Gray, Waterman, Bruning, Burdiekin, Moroney, Lancaster, Henderson, McLeod, Raub, Jones, Briggs, Rimmer, Sandon, Sayle, Chesterfield, Marshall, Muir, Siddon, Chalmers, Du Faur, Sloss, Porter, Iliffe, West, Currow, Zolles, Barnden, Smith, Neilson, Brooke, Groves, Walsh, Mr. X and Mr. XX.

The scribe apologises for any names incorrectly spelt as great difficulty is experienced in deciphering some of the names and members who desire correct spelling of their names to appear please print same.

Last but by no means least was the President of F.H.Q.'s advice regarding the partial restoration of frequencies and other matters which were fully covered in the last issue.

The next meeting being the Annual one, a great roll up is expected and provision has been made for the reinforcing of walls to stand the strain both orally and physically.

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From the North East we learn that VK3HP, of Springhurst, is on the air at last using CW; VK2OJ in Albury has been rebuilding his rig and making a real dandy job of it too incorporating all his post war ideas. VK3YV in Wangaratta is very happy with the contacts he has made using the old 40 mx Zepp, ZS6DW, ZS6DJ, ZS1AX, ZS2CI, ZS2AZ, TG8PB, CE1AH, XZ2DF, XZ4AR, VS1BJ, VS4JH, OQ6BL, PK4DA as well as most of the Pacific Islands, etc. Has also commenced building a steel tower to hold up a 3 element rotary beam as is VK3JK who blew up two of his 802's.

QUEENSLAND

Secretary: C. Marley, VK4CJ,

Box 638 J. G.P.O., Brisbane.

Meeting Place: State Service Building, Elizabeth St., City.

Meeting Night: First Friday of each month.

Notes this month are something of a problem, what with power restrictions, etc., and the record low attendance of seven at the last General Meeting as a result of same. General Meetings are a good source of dope and we're feeling the pinch! However happy days are here again and as well as 240 we also have 20 and 40 which is very FB whichever way you look at it.

Then there was the Field Day held on the weekend, 8th and 9th July. Although only three teams participated, everyone had a whale of a time, 4ES, 4JP and 4KS were the stations taking part. The individual operators being respectively 4ZU, 4VJ and 4RC with 4FY and others looking in occasionally. 4JP and 4KS operated from hill-tops on the outside suburbs of Brisbane and 4ES from Clear Mountain; a mountain—I beg pardon—a hill about 20 miles from Brisbane. This particular site proved a veritable paradise for reception and with the help of a

3 element beam, the DX rolled in in great style. Unfortunately, our little 4 watt signal didn't roll out to such good advantage, at least as far as DX was concerned. We worked ourselves to exhaustion contacting VK3's however, 4JP and 4KS having the same experience.

What with Herb (4ES) calling CQ DX on phone with the Modulator off, 4KS up on the roof of a shack with 4RC holding up the mike for him to speak into, and 4JP with a steak in one hand and a mike in the other, it was good fun. If any of you fellows are wondering what 4KS was doing up on the above mentioned roof, I forgot to mention that he was holding the Antenna up during a period of slight disorganisation. The show culminated with 4JP having the top score, 4ES second and 4KS third. Good work fellows and we hope that there are more entries next time.

The QSL Bureau is functioning very nicely under the care of 4EN, so there's no excuse for you fellows with stacks of cards waiting for dispatch—you know what to do with them. Mention of 4EN brings to mind the fact that there are now a lot of the local lads working for the P.M.G. in one Department or another. A few are 4CJ, 4RF, 4AH, 4FE, 4LW, 4EL, 4HU, 4HM, 4EN, 4HR and numerous prospective hams.

The 6 metre band is becoming a little more popular with 4AW, 4RY, 4FB, and 4ZU now having a megacycle each to play with. There is plenty of room for anyone else however, as we are quite willing to share our respective megacycles!

The first post-war year of the VK4 Division has passed by and finds the Institute in a firm position although still greatly handicapped by the lack of a permanent room of our own. By the time this appears in print we expect that something will have been done to give some service to country men, at least as far as the Library is concerned, the QSL Bureau is of course available for all who care to use it, CUL 4ZU.

SOUTH AUSTRALIA

Secretary: E. A. Barbier, VK5MD,
Box 1234 E, G.P.O., Adelaide.

Meeting Place: 17 Waymouth Street, Adelaide.

Meeting Night: Second Tuesday of each month.

The Monthly General Meeting was held on Tuesday, 19th June, at 17 Waymouth Street, and a splendid attendance of 100 members was again noted. It will be interesting to watch the future attendance at meetings in view of the fact that new bands have been partially released. Good night time contacts missing on 28 Mc. in the past and now available on 7 and 14 Mc. should be the acid test as far as attendances at meetings are concerned.

The lecturer for the night was Mr. E. L. Andrews (VK5EL) whose subject "YAGI ANTENNAS" was delivered in an instructive and interesting manner, a somewhat difficult feat at times where technical subjects are concerned.

Mr. Andrews explained the advantages of beam antennas in the fact that they gave a directive lobe of increased signal strength and cut out unwanted signals when used for reception. He also described several methods of obtaining a beam antenna, such as stacked array, phased array (long wire) and parasitic arrays, and the advantages or disadvantages of each. Two parasitic arrays in the "YAGI" and "WYNDHAM" were described at length with particular reference to the effect of adding elements. The methods of feeding and adjusting these elements including a discussion on the merits and demerits of co-axial cable rounded off the lecture. Question time found Mr. Andrews besieged with queries, the number of which demonstrated the effectiveness of the lecture.

A vote of thanks to the lecturer was proposed by Mr. W. W. Parsons (VK5PS) and carried with acclamation.

Regarding "off frequency" reports which increased with the release of the new frequencies, several amateurs, although aware that their crystal was close to the edge of the bands, were foolish enough to take a chance. When we remind you that one "Ham" was reported 3 Kc. off frequency it will be realised that more than ordinary care must be taken. P.M.G. frequency checks are not of the hit or miss variety.

It is with regret that the resignation of Mr. Ted McGrath (VK5MO) from the Council is announced. Ted has been a solid and enthusiastic worker for many years and during the war period did much to keep the W.I.A. from sinking into oblivion. Pressure of business is the reason and it is unfortunate that the Council has lost the services of a member of such high standing in the Professional and Amateur Radio world.

The trophy donated by the I.R.E. to the Institute is to be presented to the licensed amateur who produces satisfactory confirmation of the greatest distance contacted on 50 Mc. or the higher frequencies during the twelve months ending 31/7/47. The competition will be open to members or non-members of the Institute and the Council is to be commended on its attitude in this respect. Prospect to Port Adelaide is the greatest distance covered so far in this competition, 5GB and 5QR were the participants.

The membership of the South Australian Division is now 213 members and enthusiasm is still at a record peak. The few licensed hams who are not members probably do not realise that as an organised body the amateurs are strong, disorganised they are at the mercy of those who may feel like having a shot at them. What about it?

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The Institute Frequency Meter is expected to be available for calibration purposes in the near future. Several simple rules have been drawn up and any member who wishes to avail himself of the facilities available should contact Mr. A. F. Wreford, VK5DW, who has the imposing title of "Custodian of the Frequency Meter." Don't let the title scare you, he is an extra good scout. No checks over the air are as yet contemplated as sufficient bench work on members' apparatus is expected to keep the "C. of the F. M." busy for a long time.

The first meeting of the new Council was held on Tuesday, 2nd July, and the following appointments were made:—

President: I. Thomas (VK5IT).
 Vice-President: J. Kilgarriff (VK5JT).
 Secretary: E. A. Barbier (VK5MD).
 Treasurer: C. H. Basey (VK5BZ).
 QSL Officer and Programme Organiser: G. W. Luxon (VK5RX).
 Membership Organiser: J. McAlister.
 Publicity Officer: W. Parsons (VK5PS).
 Instrument Custodian: A. F. Wreford (VK5DW).
 The office of Assistant Secretary has yet to be filled

WESTERN AUSTRALIA

Hon. Secretary: H. B. Lang,
 42 Ord Street, Claremont, W.A.
 Meeting Place: Builders' Exchange, St. Georges Ter., Perth.
 Meeting Night: Third Monday in each Month.

The June General Meeting of the Division was held as usual on the Third Monday of the month and quite a representative gathering of members were present.

Council members met at 7.30 p.m. Present were 6GM in the chair, 6HL, 6FL, 6WS, 6KW, 6TX, 6WH and 6LW. Several new nominations were dealt with and essential

business prepared for the General Meeting which commenced at 8 p.m.

Quite a deal of discussion centered around the Convention report, and it is to be hoped that Major J. Squires (6JS) will be present at the next General Meeting to give us his personal impressions.

During the course of the evening, Capt. M. Murray (6MY) gave a very interesting lecture on "Army Transmitters and Receivers." Mal has a style all his own and the way he delivered this lecture was no exception. A very hearty vote of thanks was carried in the usual manner.

Western Activities

6AJ is leaving us for the land of VK4. Transferred to Townsville. Remember VK6 when you fire the rig Jack.

6DJ still key punching and landing some choice ones with his 807 final. Latest, AC4YN.

6WH.—Building new final and spending a great deal of time on 7 Mc. band. How's DX Ted?

6KW.—Chasing from band to band. Still favours "Ten" though heard frequently on 14 Mc. zone.

6RU.—Mostly CW on 20, but still getting some nice DX on "Ten." What price the QRM Jim?

6BW.—Still at the "Golden Mile." No activity as yet. Doesn't like 220 volts D.C. mains! (hi).

6DN and 6RS both new ones on 14 Mc. band. Ron had bad luck with Xtal. Just out eh Ron?

6HL.—Having a good spin with the rig but you ask him about contacts (hi). Well Harry if its not one thing it must be another.

6NL.—Silence on 14 Mc. (maybe under the QRM). Very busy at new QTH. Has plans for rotary.

6LW is still busy as a bee. Is now on 168 Mc. having had contacts on 7, 14, 28, and 50 Mc. bands. No luck as yet on 168. Here's hoping Wally, and I hope you make it soon.

6JS.—Back in town and threatens activity soon.

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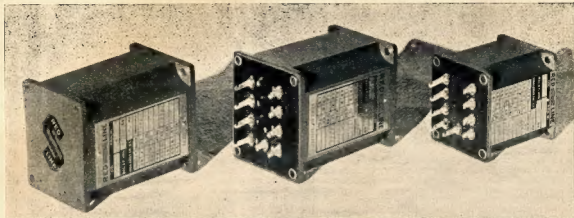
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LOOK FOR THE RED LINE MONOGRAM

6WZ asking awkward questions per telegram. You wouldn't be the only one Harry! Look for the lads on 7 Mc. Sunday mornings.

6MU.—Very active on "Ten" but nothing as yet on 7 or 14 Mc. Sunday for you too Mal.

6RG having trouble with P.P. 807 final. Should be active on 7 and 28 Mc. bands soon.

6PJ.—Very active and nice signal. Waiting phone permit. Having little or no luck with 14 Mc. DX.

6DF.—Rebuilding. I have heard, but must see. Believe this to be something really good.

6DD.—Very active, and pulling off some nice contacts, latest is T12OC. Putting up Vee Beam.

6RW.—Glad to know you are out of hospital Bob. Maybe some activity here soon.

6GM.—No sign yet. Better get the required gear and make good use of that "A" licence.

6SA.—Still silent. That new rig should be just about ready Jim.

6MB.—Heard on 14 Mc. but still has his troubles. What is doing on "Ten" Bill.

6HM has FB signal on 50 Mc. band also has the 832 going nicely on 168 Mc. Not heard on the lower frequencies lately. How about a three-way on 168 Chas.

6FL mostly on 14 Mc. CW and fone. Considering 14 Mc. rotary, but not as yet.

No news of the Port boys this month. Maybe they are doing things and going places.

Conditions generally in VK6 at the moment are very patchy. Not enough activity on 50-54 Mc. band as yet. "Ten" still holding up rather well with some nice contacts available; and at times Europeans breaking through round 1900 G.M.T. on 14 Mc. (200 Kcs. of it). What a band, what a bedlam, but it's good to be there just the same. If you can't copy CW through QRM here's the chance to learn. On 7 Mc. there are plenty of VK and W signals but little local activity as yet.

Country members! We are interested in your activity.

TASMANIA

Secretary: J. Brown, VK7BJ,
12 Thirza Street, New Town. 'Phone W 1328.

Meeting place, Photographic Society's Rooms,
162 Liverpool Street, Hobart.

Meeting Night: First Wednesday of each month.

At the meeting held on 3/7/46 as above, the Council present were L. Jensen (7LJ) in the chair, J. Brown (7BJ), A. Finch (7CJ), C. Walch (7CW), F. Gee (7RF), A. Allen (7PA). Apology from T. Connor (7CT) who was later present at the General Meeting. All possible general business was cleared in readiness for the General Meeting.

Three new membership applications were received and recommended to General Meeting for acceptance. Correspondence from P.M.G.'s Department advising of the opening of part of the 7 and 14 Mc. bands was read, also letters from F.H.Q. advising of the intended early issuing of badges and asking for information re members' interest in the old 200 Metres broadcasting permits. All were left for discussion at the General Meeting.

As this Division had not as yet elected a Federal Councillor it was decided to do so immediately and to recommend to the General Meeting that the Secretary be elected forthwith to this office. This being all the Council business, the meeting closed.

General Meeting.—Present, all as at Council, F. E. Nicholls (7RY), T. Connor (7CT), R. Conrad (7TR), Hughson, K. Kelly (7LL), A. Russell, Clark, M. Loveless (7ML), A. Morrisby (7VJ), R. O'May (7OM), C. Miller (7CM), D. Watson (7DW), W. Watson (7YY), W. T. Hooker (7JH), D. Hildyard (7DH), Koglin, and apologies from T. Allen (7AL) and O. S. Dahl.

Three new members were elected unanimously by show of hands.

As an outcome of the correspondence, members welcomed the news of the 7 and 14 Mc. bands being partly available, general anticipation is a lot of QRM until they expand more. The supply of new badges is eagerly awaited.

Not a great deal of interest was expressed in the matter of reviewing the old custom of a limited number operating on 200-meter phone as in pre-war days, although several of the old 200 gang were present. The general impression was that, if this concession again became available, several would possibly have another go at it.

The election of a Federal Councillor was discussed and the Council's recommendation was accepted and the Secretary, J. Brown, was duly nominated and elected to the office.

The President welcomed our old friend and ex-President, W. T. Hooker (7JH), to the meeting. This is Jack's first appearance since the war and all were glad to renew acquaintances. In replying, 7JH apologised for not being able to attend meetings regularly but pointed out that Waddamana was a bit far away unless he happened to be in the City on meeting nights as he was tonight, he hoped to be able to take advantage of the opening of the lower frequencies to keep in touch. Ten meters had been hopeless in his present location.

The Treasurer drew members' attention to the fact that the New Year had begun and the books were open for subscriptions. Under the Articles, there is a limited time in which to meet this obligation, so members are advised to become financial at their earliest opportunity.

The talk was given by C. Miller (7CM). Bass Suppression and Audio Band Pass Filters was the subject and Charlie took it in his stride, no doubt these lads who devote themselves to study can master these subjects and those present went away with some good practical information on this subject as it was clearly put and well detailed on the "Oscillating Blackboard." To complete the evening, Charlie gave a short talk on his experiences with rotary beams—horizontal, vertical and "accidental" (should a halyard break for instance). At the conclusion he was accorded a hearty vote of thanks by acclamation in appreciation of such a practical and interesting lecture.

Comments in the VK7 June Notes re the Convention have, since the perusal of the Official Minutes, shown to have no foundation and I trust that those who may have read these comments will also study the official minutes and accept any apologies thought necessary. I regret the unjustifiable inferences. 73's de 7PA.

TASMANIAN ANNUAL GENERAL MEETING AND DINNER

The Annual General Meeting of this Division was conducted at 6 p.m. on Saturday, 15th June, at 162 Liverpool Street.

Present were Messrs. A. E. Allen (7PA), T. Allen (7AL), R. Conrad (7TR), T. Connor (7CT), Clark, S. Dahl, A. Finch (7CJ), F. Gee (7RF), N. Hopwood (7GJ), Hughson, L. Jensen (7LJ), M. Loveless (7ML), F. Medhurst (7AH), A. Morrisby (7VJ), C. Miller (7CM), E. Nicholls (7RY), N. Nielson, G. Richardson, R. O'May (7OM), C. Walch (7CW), D. Watson (7DW), apologies from C. Oldham (7XA), R. Bulman, K. M. Kelly (7LL), and T. Moore.

Business—Election of Officers for ensuing 12 months and Presentation of Reports.

T. Connor and A. Morrisby were elected scrutineers. The President's report gave a glowing account of the Division's activities and rapid return to strength in the short year that we have been active since resuming. The membership now stands at 46 and is steadily increasing.

The Treasurer's report showed a most satisfactory period, for with a bank balance of £1/16/7 carried forward from pre-war days, we have been able to meet all commitments including per Capita payments and show a balance of £8/10/2.

Two only nominees had failed to become financial. The Secretary stated that his part had been generally

very satisfactory and thanked the Treasurer for assistance rendered at meetings. He also attributed a lot of his success, shall we say, to the energetic work of the President which had eased his burden considerably.

The past fortnight had just about made him a nervous wreck though—he claims—that arranging an Annual Dinner is worse than anything he has yet encountered, particularly to get the necessary speakers for toasts. At this juncture the scrutineers turned up with the ballot results thus avoiding an inevitable total collapse. No doubt though Joe, self consciousness and lack of experience makes most of us want to "pass the buck," hence the dearth of speakers.

The ballot resulted in Messrs. A. E. Allen (7PA), J. Brown (7BJ), T. Connor (7CT), A. E. Finch (7CJ), D. H. Fisher (7AB), R. F. Gee (7RF), L. R. Jensen (7LJ), C. A. Walch (7CW) being elected Councillors.

The position of Councillor for Launceston and districts is unfortunately still vacant. Office-Bearers were elected as under:—

Patron: F. W. Medhurst (7AH).

President: L. R. Jensen (7LJ).

Vice-Presidents: A. E. Allen (7PA), C. A. Walch (7CW).

Hon. Secretary: J. Brown (7BJ).

Treasurer: A. E. Finch (7CJ).

Publicity: A. E. Allen.

QSL Bureau: T. A. Allen (7AL).

During the President's report he made mention of the work done during the war years by 7PA in maintaining contact with F.H.Q. on behalf of this State.

As an outcome of this, 7PA replying, asked that a minute be put on record acknowledging the assistance he had received from L. P. Hyland (7LP) who, up to his death, had shown himself to be a most enthusiastic and energetic amateur, and W.I.A. member and one who would have been an asset to the Division at all times. Overwork and self-sacrifice reduced his health to such a degree that pneumonia with complications following a chill, found him unable to withstand it and thus the end came to one of VK7's relatively new hams, but nevertheless one who had proved his worth.

At the conclusion of this meeting an adjournment was made to Hanton's Cafe where the Annual Dinner was scheduled to take place at 7.15 p.m.

ANNUAL DINNER—21st BIRTHDAY

This, the first annual celebration of W.I.A. in VK7 since the end of hostilities, was also the 21st Anniversary of the Division's incorporation. Hotel catering being so rare these times, it was found necessary to accept a cafe as the next best place, and a most pleasant evening was spent and little fault could be found except in liquid refreshments, which, per force, had to be limited.

Present were—Visitors, Messrs. K. Burbury and C. Carroll (P.M.G.'s Department), W. Nicholas (7WR) broadcasting stations, T. Weeks VIIH commercial and Sharland Press. Members: Messrs. F. W. Medhurst (Patron), L. R. Jensen, J. Brown, A. Finch, M. Loveless, T. Allen, T. Connor, C. Walch, F. Gee, A. Morrisby, C. Miller, W. Watson (7YY), D. Watson, R. Conrad, Hughson, Clark, R. O'May, N. Hopwood, E. Nicholls, G. Richardson, O. S. Dahl, N. Nielson, A. E. Allen.

The evening kicked off to a good tempo with all making the best of things. The fare was good and the appetites, not to be denied, did justice to that which was forthcoming.

Toasts appropriate to the evening were then indulged in and were drunk with all the zest possible and although, with one or two possible exceptions, there were no public speakers amongst the gang, those responsible did a creditable job. A few anecdotes tacked on here and there in the responses covering experiences both civil and services, were very interesting and, in some cases, humorous.

A brief session of "ragchewing" brought a very successful evening to an end in the typical Ham spirit and the time being not yet 10 p.m., those so inclined retired for an extra couple of tiddies ere wending their way homeward.

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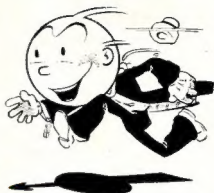
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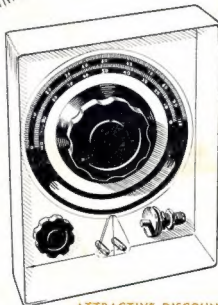


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